



Remittances-Output Nexus: Evidence from Nigeria

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Abstract

This paper examines remittances–growth nexus for Nigeria by applying cointegration and Granger causality analysis. The data set used is annual time series observations for the period 1977 – 2016. Four possible hypotheses were examined: i) remittances inflow cause growth, ii) growth cause remittances inflow, iii) there is a bi-directional causality between the two variables and iv) both variables are causality independent. Granger causality test result shows that remittance lead growth in the short-run, but there is no long-run relationship between the variables.

Keywords: Remittances; Economic Growth; Cointegration.

JEL Classification: C22, F24, F43, O53

1. Introduction

Remittances are generally defined as that portion of migrants' earnings sent from the migration destinations to the migrants' places of origin. Remittances can be sent in cash or kind. But, usually the term is used to indicate monetary and other cash transfers by immigrants to their families at their home countries (Solimano, 2003). According to a report by World Development Finance (2005), workers remittances provide valuable financial resources to developing countries, particularly the poorest. The remittances from migrants working abroad are important for both families of migrants and the balance of payment of their home countries. Remittances contribute significantly to the gross domestic product as well as foreign exchange earnings of many developing countries.

Benefits of remittances to the countries of origin are many. Remittances may improve income distribution and quality of life beyond what other available development approaches could deliver. Most studies about remittance revealed that remittances are spent on current consumption, health and education, thus leading to improved standards of living for emigrant households compared to non-emigrant households.

Migration has been a process in human history from time immemorial. The political, economic and social factors around the world have driven millions of people abroad from their home countries. These factors can be grouped into two categories namely; push and pull factors. Wars, social insecurities, natural calamities and political uncertainties are the push factors. While factors like employment, higher wages, better living standards and better working conditions have been the major pull factors.

Migration whether internal or international, has become an important livelihood strategy among households in most developing countries. According to the International Migration Report (2015) in 2015 about 244 million migrants lived and worked outside their countries of birth. Remittances sent back home by these migrants is believed to have a huge impact on the socio-economic conditions of families left behind in the countries of origin. United Nations statistical figures shows that remittance flows to Sub-Saharan Africa stood at \$33 billion in 2016, and is projected to increase by 3.3 percent to \$34 billion in 2017. Furthermore in 2015, Nigeria was the sixth most remittance recipient countries in the world receiving a whopping sum of \$20.8 billion (see Migration and Remittances Factbook, 2016).

Because of the increasing size and importance of remittances to the growth and development of recipient countries such as Nigeria, a number of studies have been conducted to explore the impact of remittance on growth and development (see Kure and Nwosu, 2008; Udah, 2011; Ojapinwa, 2012; Oke, 2011; Babatunde, 2010 and Nwaru et al. 2011). However, these studies have reported mixed results warranting a reexamination of the issue using new dataset and robust technique of analysis which this study addressed.

In examining the relationship between remittances and growth, we are confronted with the question regarding whether changes in remittances affect growth or vice versa. We approach this question by using Granger (1969) causality tests. This model is quite simple and has been used extensively in applied economic research. Further, we make use of cointegration test to establish or refute the long-run relationship between remittances and growth. The paper is organized as follows: section two is devoted to literature review, the model is presented in section three, empirical evidence is presented in section four and finally concluding remarks are presented in section five.

2. Literature Review

In this section, we present a review of empirical literature on remittances-growth nexus by first presenting international evidence followed by evidence from Nigeria in order to bring out the gap that this study addresses. We begin with the study by Azam and Khan (2011) which investigate the relationship between workers' remittance and economic growth in Azerbaijan and Armenia for the period 1995 to 2010. They employed simple log linear method of least square as an analytical technique and reported that workers' remittances contribute significantly to economic growth.

Ang (2007) explore the causal relationship between workers' remittances and economic growth in the Philippines; using secondary panel data for the period 1988 to 2004. His study took two dimensions i.e. at the national and regional levels, using pooled regression first followed by OLS regression. His study concludes that, there exist positive relationship between workers' remittance and economic growth at national level, while at regional levels the analysis reported mixed results due to lack of consistent data sets on the regions, indicating that remittances do not positively affects economic growth.

Siddique (2012) investigate the causal link between remittances and economic growth in Bangladesh, India and Sri Lanka. He used time series data for the period 1977 - 2006. Two variables were used i.e. per capita remittances and economic growth. Cointegration and Granger causality tests were the main techniques of analysis employed. Their results revealed no evidence of cointegration. They further investigated causality between remittances and economic growth, and reported that growth in remittances does lead to economic growth in Bangladesh. There was however, no causal relationship between the variables for India. But bi-directional causality for Sri Lanka.

Giuliano et al. (2005) used secondary data for the period (1975 – 2002) with sample of 100 countries, to explore the relationship between remittances, financial development and economic growth. Due to non-availability of data on remittances for some countries their study employed purposive sampling technique, where data was generated from 29 countries. A pooled data set was thus utilized. First, the impact of remittances on economic growth was estimated followed by an investigation of the role of remittances on growth through financial markets. Their findings revealed that remittances have contributed to promoting growth in countries with shallower financial system and also the evidence in favour of positive role of remittances on growth seems to be at most fragile. Their analysis further reveals a significant positive impact of remittances on growth and investment once the interaction with financial development is accounted for. Their analysis furthermore indicate that remittances and financial development have been used as substitutes to promote economic growth in the study area.

Jongwanich (2007) examine the impact of workers' remittances on growth and poverty in developing countries of Asia and Pacific. The author used panel data over a period of 10 years (1993 – 2003). The first estimation of the parameters for growth and poverty shows that the direct impact of remittances on growth is nil i.e. negative and statistically insignificant. The study also reported that remittances seem to have a positive but marginal impact on economic growth through improvement in domestic investment and human capital. Furthermore, remittances have a significant direct impact on poverty reduction through increasing income, smoothing consumption and easing capital constraints of the poor.

Aggarwal et al. (2006) explore the relationship between workers' remittances and financial development. They used panel data for 99 developing countries for the period 1975 to 2003. The authors estimated both Fixed Effects (FE) and Random Effects (RE) regressions. Their findings revealed that financial development is positively affected by country size and level of income, while remittances have a positive and significant effect on financial development, the result also revealed that the positive impact of remittances on financial development is not due to endogeneity biases. It was observed that workers' remittances flow received from migrant workers residing abroad have become the second largest source of external finance for developing countries in recent years.

Mundaca (2007) examine the impact of remittances on economic growth and the role of financial markets development in Mexico and the Dominican Republic. The author employed regression technique to analyse secondary panel data for the period 1970 to 2003. His findings show that; fixed capital investment and remittances influences growth positively. In addition, all other explanatory variables with the exception of initial output per capita were statistically and numerically significant, meaning that they are important in explaining growth rate per capita. It is remarkable to find that financial development seems to affect modestly but still positively growth if remittances are available. And the effect of remittances on growth becomes stronger when the indicators of financial development are included. The latter result implied that financial development and remittances act as complementary to the growth process.

Eltayeb and Sidoropoulos (2010) explore the effect of workers' remittances on economic growth for a sample of seven (7) remittance receiving MENA (Middle-East and North African) countries, using panel data for the period 1975 to 2006. Both fixed-effects and random-effect models were used to estimate a standard growth model in accordance with a modified version of the Giuliano and Ruiz-Arranz (2005) model. Results of this study lend support for the view that remittances have a positive impact on growth both directly and indirectly through their interaction with financial and institutional channels. The results further revealed that the interaction terms of remittances and financial development shows how remittances work. The interaction terms between credit and remittance is negative and significant, which suggests that remittances have more positive impact on growth in countries with less access to credit.

Iqbal and Sattar (2005) investigate the contribution of workers' remittances to economic growth in Pakistan. The authors use time series data for the period of 1972 to 2003. Multiple regression frameworks were used for data analysis. The explanatory variables used were remittance, private investment, external debt, terms of trade, per capita income and inflation rate. The finding reveals a positive and highly significant relationship between workers' remittances and real GDP growth, implying that; higher remittances are associated with higher economic growth. This result indicate that remittances have positively contributed to output growth in Pakistan during the study period. Thus the sustainable level of workers' remittance may be an important prerequisite for accelerating real output growth. The findings further tend to support the notion that higher rate of domestic investment (both private and public) leads to higher rate of economic growth in the study area. One of the key findings of this study is that; among the explanatory variables taken in the analysis, workers' remittances prove to be the third main contributor to economic growth.

Empirical evidence on remittance-growth nexus from Nigeria include Kure and Nwosu (2008) which explore the causal relationship between workers' remittances and economic growth in Nigeria. Using secondary data obtained from Central Bank of Nigeria (CBN) for the period of 1990 to 2007. The authors employed simultaneous equation system to regress economic growth and its determinants based on two-stage least square instrumental variable (2SLSIV) approach. Their findings revealed that; remittances have a positive impact on economic growth through investment in private and human capital. A key policy reference of the study is that remittances should not be seen as a substitute for other source of growth, but a complement. It is obvious from the result of their study that human capital investment is a key channel through which remittances could generate positive effect on economic development.

Udah (2011) investigate the relationship between remittances, human capital and economic performance in Nigeria, using time series data for the period of 38 years between 1970 and 2008. Ng and Perron (2001) modified unit-root test and Autoregressive Distribution Lag Model approach was employed as a technique of analysis. The short-run error correction result indicates that with the exception of remittance, all other variables of interest had the correct apriori signs and were statistically significant. The result also showed that remittances affect economic performance in Nigeria through interaction with human capital and technology diffusion. The findings of this study strongly suggest that for remittance to accelerate the pace of economic development it requires complimentary factors, these include; high level of human capital development, technological diffusion, physical capital and increase investment in education and infrastructure.

Ojapinwa (2012) conducted his study on determinants of migrants' remittances in Nigeria using time series data for the period of 1977 to 2009. The author used workers' remittances as dependent variable while the independent variables were: real GDP, unemployment rate, population growth, consumer price index, financial deepening, real interest rate and openness (measured as ratio of export plus import to GDP). Ordinary least square (OLS) regression method was used for analysis. The findings revealed that, the main determinants of migrants' remittances were real GDP, labour market situation proxied by unemployment rate and population growth, while unemployment rate, openness, inflation and debt-income rate are negatively related to migrants' remittances. The findings of the study imply that improving financial market deepening, intermediation and preventing exchange rate misalignment would helped to increase the flow of remittances.

Oke (2011) examine the impact of workers' remittances on financial development in Nigeria between 1977 and 2009. The author employed generalized method of moments (GMM) for estimation. Two indicators of financial development were employed in their study; the first indicator financial depth is the ratio of money supply to GDP, it measures the size and level of financial intermediation. The second indicator was the ratio of credit to private sector to GDP. Their result indicate that the coefficients of remittances are correctly signed and are significant. This means that whether financial

development is measured as a ratio of money supply to GDP or ratio of credit to GDP, remittances positively and significantly influence financial development. Result of (GMM) estimation indicate insignificant coefficient, the implication is that remittances augment liquid liabilities more than loanable funds, as remittances are likely used for consumption purposes than for productive ventures. Hence the result generally indicate that remittances positively and significantly influence financial development. It has been observed that remittances not only boost the financial intermediaries and the level of financial intermediation. It also helps channel more loanable funds to the private sector in Nigeria during the period under consideration.

Nwaru et al. (2011) explore the impact of migrant remittances on the welfare of arable crop farm households in South Eastern Nigeria, which comprises 5 states: Abia, Anambra, Ebonyi, Enugu and Imo between 2008 and 2009 using primary data where a multi-stage random sampling technique was used in choosing a sample of 120 respondents, comprising 60 each of migrant remittance receiving and non- remittance receiving household through the cost route method. Data was analyzed using frequency distribution, regression analysis and Chows test statistics. The result revealed that the remittance receiving households were relatively older, cultivated more farmland, produced greater output and had higher income than the non-remittance receiving household. The remittance receiving and non-remittance receiving households spent approximately the same number of years on formal education and had average of 6 and 7 persons per household respectively. Household size was significant and negatively related to welfare for the remittance receiving household while it was insignificant for their non-remittance receiving counterpart. Chows' test revealed that the remittances receiving household have higher welfare status than their non-remittance receiving counterparts. This suggests that larger households are more likely to have reduced welfare, which is consistent with economic theory.

Babatunde (2010) investigated the impact of remittances on food security and nutrition in rural Nigeria, using primary data collected from a comprehensive survey of farm household in Kwara state, north central region of Nigeria. The researcher employed a three-stage random sampling technique in selecting sample farm household. Eight (8) out of 16 local governments areas were randomly selected in the first stage, then 5 villages were randomly chosen from each of the selected local governments and lastly 6 households were sampled in each of the resulting 40 villages, using complete village household list provided by the local authorities. Overall 240 farm households were selected. However, only 220 were used for the analysis due to missing values in 20 households. Personal interviews were carried out with the household heads, a standardized questionnaire was used that covered information on migration and remittances, household food consumption, anthropometry data, income, socioeconomic characteristic and various institutional and contextual variables. Descriptive and econometric analyses were used to test whether remittance income improved nutritional status in the study area.

The result shows that; income, assets are important food security and nutritional indicators, differentiating between remittance receiving and non-remittance receiving, household is significantly larger compared to those non-remittance receiving household. Descriptive analysis of the sample data indicates that; compared to non-receiving household, remittance receiving households are better off in terms of mean total income, assets, calorie supply, micronutrients supply, as well as child nutritional status. The results further show that remittance income contribute to improve calorie supply at the household level.

3. Data, Model and Estimation Procedure

3.1 Data

The data for this study is obtained from National Bureau of Statistics (NBS) and Central Bank of Nigeria (CBN). It consists of annual series of two variables – remittance per capita and economic growth proxied by real GDP. The study period cover the period 1977 – 2016 (40 years), thus providing a total of 40 data points per variable.

3.2 Unit Root Test

Many econometric studies published in the academic literature have suggested cointegration models to examine the long-run relationships between macroeconomic variables. However, some economists also suggested specifying the regression with levels of economic variables rather than the difference. According to Plosser and Schwert (1978), when time series regression is computed using levels of economic variables, they may produce strong relationships with high R^2 , but when the same model use differences in the variables, the relationships become negligible. Further, Granger and Newbold (1974), showed that when the time series variables are nonstationary, using levels may result in non-constant mean over time and residuals which are highly autocorrelated with low Durbin-Watson statistics. For this reason, Granger and Newbold (1974) recommended using difference of each variables until each variable is stationary before running the regression. Furthermore, as pointed out by Plosser and Schwert (1978) in an undifferenced regression, the disturbance term is nonstationary and is not well behaved. For this reason, they argue that with most economic time series it is better to work with the differenced economic data rather than data in levels. Maddala (1992) argues for the need for regression with differenced data rather than regressions with data in levels.

For the reasons discussed earlier, one has to exercise care when using data in levels rather than the differences. Griffiths, Hill and Carter (1993) argue that "The usual statistical properties of least squares hold only when the time series variables involved are stationary," and therefore, according to them nonstationary series has to be differenced before performing econometric analysis. In this study, we use the Augmented Dickey Fuller Test (ADF) to test unit roots. Schwert (1989) suggested that the ADF with long lags is superior to other models. Accordingly, the general specification of the model can be stated as follows:

$$\Delta y_t = \alpha + (1 - \Phi)y_{t-1} + \gamma_t + \sum_{i=1}^p \beta_i \Delta y_{t-i} + \varepsilon_t \quad (3.1)$$

where Δ is the first difference operator. For the purpose of this study, we define Rmt to be per capita remittances, and $Growth$ to be the real GDP. Hence, the ADF test is based on the following formulation:

$$\Delta Rmt_t = \alpha_0 + (1 - \lambda_1)Rmt_{t-1} + \gamma_{1t} + \sum_{i=1}^p \alpha_i \Delta Rmt_{t-i} + \varepsilon_{1t} \quad (3.2)$$

$$\Delta Growth_t = \beta_0 + (1 - \lambda_2)Growth_{t-1} + \gamma_{2t} + \sum_{i=1}^p \beta_i \Delta Growth_{t-i} + \varepsilon_{2t} \quad (3.3)$$

where $\alpha_0, \alpha_1, \lambda_1, \lambda_2, \gamma_1, \gamma_2, \beta_0, \beta_i$ are coefficients, and $\varepsilon_{1t}, \varepsilon_{2t}$, are white noise terms. The null hypothesis for ADF test is stipulated that for $H_0 : \lambda_1 = \lambda_2 = 0$ with the alternative hypothesis $H_a : -2 < \lambda_1 < 0$; and $H_a : -2 < \lambda_2 < 0$ for equations (3.2) and (3.3) respectively. The null hypothesis will be rejected if the t-statistics are less than the critical value. It is quite possible that we may fail to reject the H_0 of unit root because of the low power of the unit root tests. However, Kwiatkowski et al. (1992) recommended a test in which the null hypothesis is stationary and the alternative hypothesis is a unit root. The test is stated as follows:

$$KPSS = \frac{1}{T^2} \sum_{t=1}^T S_{t^2} / S^2 L \quad (3.4)$$

where KPSS is the Kwiatkowski, Phillips, Schmidt, and Shin test

$$S^2 = \frac{1}{T} \sum_{t=1}^T e_t^2 + \frac{2}{T} \sum_{s=1}^L (1 - s/L + 1) + \sum_{t=i+1}^T e_t e_{t-s} \quad (3.5)$$

$$S_t = \sum_{i=1}^t e_i$$

3.3 Cointegration

Co-integration is a technique used to study the existence of an equilibrium relationship between two variables. Two or more-time series may be individually non-stationary, but some linear combination of the variables under consideration, share prices and exchange rates may have time invariant properties and hence may be cointegrated. According to Banerjee et al. (1993) "a series is said to be integrated if it accumulates past effects; such a series is non-stationary because its future path depends upon all such past influences, and is not tied to some mean to which it must eventually return." Following Engle and Granger (1987) we ran the following regression:

$$Rmt_t = \alpha + \beta_1 Growth_t + \eta_{1t} \quad (3.6)$$

$$Growth_t = \beta_0 + \beta_2 Rmt_t + \eta_{2t} \quad (3.7)$$

we then estimate

$$\Delta \hat{\eta}_t = \alpha_1 \hat{\eta}_{t-1} + \sum_{i=1}^n \alpha_{i+1} \Delta \hat{\eta}_{t-i} + \varepsilon_t \quad (3.8)$$

for both residuals η_{1t} and η_{2t} . If $-2 < \alpha_1 < 0$, then we conclude that the residuals are stationary and Rmt_t and $Growth_t$ are cointegrated, CI(1).

3.4 The Vector Autoregressive Model and Causality Tests

In order to study the relationship between the two variables in our study, we have to examine whether changes in per capita remittances cause growth to change and vice versa. In this study, we use VAR model to test the linear causality between per capita remittances and growth. Equations (3.9) and (3.10) can be used if there is no cointegration between per capita remittances and growth.

$$\Delta Rmt_t = \beta_0 + \sum_{i=1}^p \beta_{1i} \Delta Rmt_{t-1} + \sum_{i=1}^p \beta_{2i} \Delta Growth_{t-1} + \epsilon_{st} \quad (3.9)$$

$$\Delta Growth_t = \delta_0 + \sum_{i=1}^p \delta_{1i} \Delta Growth_{t-1} + \sum_{i=1}^p \delta_{2i} \Delta Rmt_{t-1} + \epsilon_{ft} \quad (3.10)$$

Granger offered four definitions of causality in this scenario: per capita remittances to growth ($Rmt \rightarrow Growth$); Growth to per capita remittances ($Growth \rightarrow Rmt$); independence between per capita remittances and growth ($Rmt \leftrightarrow Growth$); and feedback causality between per capita remittances and growth.

If per capita remittances and growth are cointegrated, then the vector autoregressive model should include an error correction term which can be stated as follows:

$$\Delta Rmt_t = \beta_0 + \varphi_1 (Rmt_{t-1} - \xi ER_{t-1}) + \sum_{i=1}^p \beta_{2i} \Delta Rmt_{t-1} + \sum_{i=1}^p \beta_{2i} \Delta Growth_{t-1} + \epsilon_{st} \quad (3.11)$$

$$\Delta Growth_t = \delta_0 + \varphi_2 (Growth_{t-1} - \xi ER_{t-1}) + \sum_{i=1}^p \delta_{1i} \Delta Growth_{t-1} + \sum_{i=1}^p \delta_{2i} \Delta Rmt_{t-1} + \epsilon_{ft} \quad (3.12)$$

The error correction term, and, represents the previous periods disequilibrium between Rmt_{t-1} and ξER_{t-1} .

4. Results and Discussions

From Table 4.1 we can see that measures of central tendency, measures of dispersion as well as skewness and kurtosis were used to present the summary statistics of the two variables, mean is used to represent measure of central tendency, while standard deviation represents measure of dispersion.

Table 4.1: Descriptive Statistics				
Variables	Mean	Std. Dev	Skewness	Kurtosis
<i>Rmt</i>	5491.734	6058.814	1.7320	4.1489
<i>Growth</i>	702.183	547.793	-0.4595	3.3404

The descriptive statistics results revealed that the mean of *Rmt* (per capita remittances) is 5491.734 and that of *Growth* is 702.183, standard deviation of *Rmt* is 6058.814 while for *Growth* it is 547.793. The skewness and kurtosis values for *Rmt* are 1.7320 and 4.1489 respectively and for *Growth* the values are -0.4595 and 3.3404 respectively. From the foregoing, it can be discerned that the distribution of the observations for the two series are not normal.

The Augmented Dickey Fuller test for unit root and KPSS test for stationarity are presented in Table 4.2. The null hypothesis (H_0) is that both series *Rmt* and *Growth* contain a unit root against the alternative hypothesis that both variables are stationary. A large negative value of ADF test statistics will lead to the rejection of the null hypothesis.

Table 4.1: Unit Root Test Results		
Variable	ADF	KPSS
<i>Rmt_t</i>	-1.6832 (1)	0.02
<i>Growth_t</i>	-2.027 (1)	0.05
ΔRmt_t	-7.136*(1)	0.03

$\Delta Growth_t$	-6.313* (1)	0.06
Notes: The critical values for ADF are 5% = -2.86; 1% = -3.43. (Fuller 1976, page 373). The number of lags for ADF are given in parenthesis. * Significant at 1% level.		

As we can see from Table 4.2, the H_0 that the time series Rmt_t and $Growth_t$ has a unit root cannot be rejected. However, the null hypothesis of a unit root is rejected after the variables have been differenced. The results are consistent with most economic time series, indicating that the series are stationary at first difference i.e. $I(1)$. We proceed to examine whether remittance per capita causes change in economic growth and vice versa. Prior to applying Granger causality tests, we have selected the appropriate lag length for remittance per capita and economic growth using Bayesian Schwarz information criteria into the causality model (equation 3.9 and 3.10). The optimum lag length for testing the Granger causality test from remittance per capita to economic growth ($Rmt \rightarrow Growth$) is seven for remittance per capita and four for economic growth. The number of optimum lags for testing causality from economic growth to remittance per capita ($Growth \rightarrow Rmt$) is three for economic growth and two for remittance per capita. The results are reported in Table 4.3.

Table 4.3: Linear Causality Tests for Remittance and Growth		
	Remittance Per Capita Causes Economic Growth ($Rmt \rightarrow Growth$)	Economic Growth Causes Remittance Per Capita ($Growth \rightarrow Rmt$)
Lag length	$n_1 = 7 \& n_2 = 4$	$n_1 = 3 \& n_2 = 2$
Dependent variable	ΔRmt_t	$\Delta Growth_t$
Constant	0.0051 (0.798)	2.581 (3.112)
ΔRmt_{t-1}	-1.176 (-1.261)	13.563 (3.89)*
ΔRmt_{t-2}	-0.271 (-0.893)	1.115 (1.231)
ΔRmt_{t-3}	-0.615 (-0.831)	
ΔRmt_{t-4}	0.711 (1.801)	
$\Delta Growth_{t-1}$	1.518 (1.154)	0.749 (0.987)
$\Delta Growth_{t-2}$	-1.209 (-0.866)	0.0565 (1.078)
$\Delta Growth_{t-3}$	1.872 (1.512)	-1.632 (-1.187)
$\Delta Growth_{t-4}$	-1.982 (-1.182)	

$\Delta Growth_{t-1}$	0.207 (0.984)	
$\Delta Growth_{t-1}$	-1.265 (-1.822)	
$\Delta Growth_{t-1}$	0.345 (1.098)	
Notes: t-values in parenthesis; <i>Rmt</i> , <i>Growth</i> and Δ are defined earlier. * significant at 1%.		

As can be seen from Table 4.3, remittance per capita causes economic growth to change, in other words, there is only unidirectional causality. Further, the unidirectional causality is confined to only one-time lag, suggesting that the influence is instantaneous, and there is no long-term causality.

Table 4.4: Estimation Result of Error Correction Model for *Rmt* and *Growth*

$\Delta Growth$		ΔRmt	
β_0	-6.53 (-1.31)	δ_0	-0.99 (-0.45)
φ_1	-0.22 (-1.61)	φ_2	-0.09 (-1.09)
$\beta_{11}(1)$ $\Delta Growth_{t-1}$	-0.89 (-4.98)	$\delta_{11}(1)$ ΔRmt_{t-1}	-0.21 (-0.87)
$\beta_{11}(2)$ $\Delta Growth_{t-2}$	-0.33 (-2.01)**	$\delta_{11}(2)$ ΔRmt_{t-2}	-0.53 (-1.51)
$\beta_{21}(1)$ ΔRmt_{t-1}	0.78 (2.77)**	$\delta_{21}(1)$ $\Delta Growth_{t-1}$	-0.07 (-1.22)
$\beta_{21}(2)$ ΔRmt_{t-2}	0.55 (1.31)	$\delta_{21}(2)$ $\Delta Growth_{t-2}$	-0.11 (-1.01)
F-Stat	8.76*	F-Stat	1.53
*Significant at 1% level; ** significant at 5% level.			

In Table 4.4, the short-run relationship between remittance per capita and economic growth can be captured by examining coefficients of β_{21} and δ_{11} . The long-run disequilibrium coefficients φ_1 and φ_2 are not statistically significant, suggesting that there is no co-movement between economic growth and remittance per capita. As can be seen from the t-statistics of coefficients $\beta_{11}(1)$, $\beta_{11}(2)$, $\beta_{21}(1)$, we may tend to argue that there are short term co-movements between remittance per capita and economic growth but it is confined to a maximum of two lag length.

5. Conclusion and Recommendations

The empirical evidence reported in this paper shows that there is evidence of short-run relationship between remittance per capita and economic growth. The Granger causality tests reveals that remittance per capita lead economic growth in the short-run, but there is no long-run relationship between the variables. The practical implication of this study is that policy makers of the Nigerian economy should implement the following policies that will promote remittance inflow into the country:

- Raise the overall education attainment levels and ensure that education provision is aligned with the long-term needs of the country. Ensure flexibility of the workforce to adapt to the changes in the global economy and to guarantee inclusiveness in education and the labour market.
- Promote new business formation, indigenous innovation and the development of local industry. Ensure that local firms are linked to the global value chains and that the country fully benefits from knowledge and technological spill-overs.

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